ALKALOIDS OF *LYCOPODIUM VOLUBILE* (LYCOPODIACEAE)

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[Manuscript received January 29, 1969]

Lycopodium alkaloids have attracted a great deal of attention and many *Lycopodium* species have been studied.[1] Because such a variety of structural types are known[1] it was of interest to examine the alkaloids from *Lycopodium volubile* Forst., a species that occurs in New Guinea and does not appear to have been investigated previously. *L. volubile* is a herbaceous vine found climbing on shrubs and trees in mid-mountain forest, and the leaves and stems give positive field tests for alkaloids.

The major alkaloid of *L. volubile* has been identified as the known alkaloid lycopodine, and another alkaloid has been identified as the alcohol dihydrolycopodine which has previously been isolated from *L. flabelliforme* and *L. complanatum*.[2]

Experimental

L. volubile was collected near Edie Creek in New Guinea (Voucher specimen TGH 11,686). Extraction of the dried leaves and stems (2·5 kg) by continuous extraction with ethanol at 40°, and work-up by the method previously described[3] afforded 13 g of crude alkaloids. When a 1·0-g sample of the crude alkaloids was chromatographed on a column of neutral alumina, a series of fractions eluted by benzene contained essentially one constituent, and crystallized on removal of the benzene. The fractions (600 mg) were combined, and crystallization from a small volume of acetone gave lycopodine as colourless prisms, m.p. 115–116°, $[\alpha]_D$ −25° (*c*, 0·57 in ethanol), picrate, m.p. 205–207°. Lycopodine was not compared with authentic reference material, but it coincided in all its spectroscopic properties (ref.[1] and references cited therein) with those reported for lycopodine,[1] including the mass spectrum which matched the published mass spectrum.[4]

A series of fractions eluted by chloroform from the alumina column also crystallized on removal of the solvent. The combined fractions (100 mg) on crystallization from a small volume of acetone gave dihydrolycopodine, m.p. 168–169°, $[\alpha]_D$ −38° (*c*, 0·18 in ethanol), which was also characterized by comparing its spectroscopic properties, including the mass spectrum, with published data.[1,4] The relationship between the two alkaloids was confirmed by reducing the major ketonic alkaloid lycopodine with sodium borohydride, as the product after crystallization from acetone was identical with the second alkaloid.

Acknowledgment

The authors are indebted to Dr T. G. Hartley for the collection and identification of *L. volubile* Forst.

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